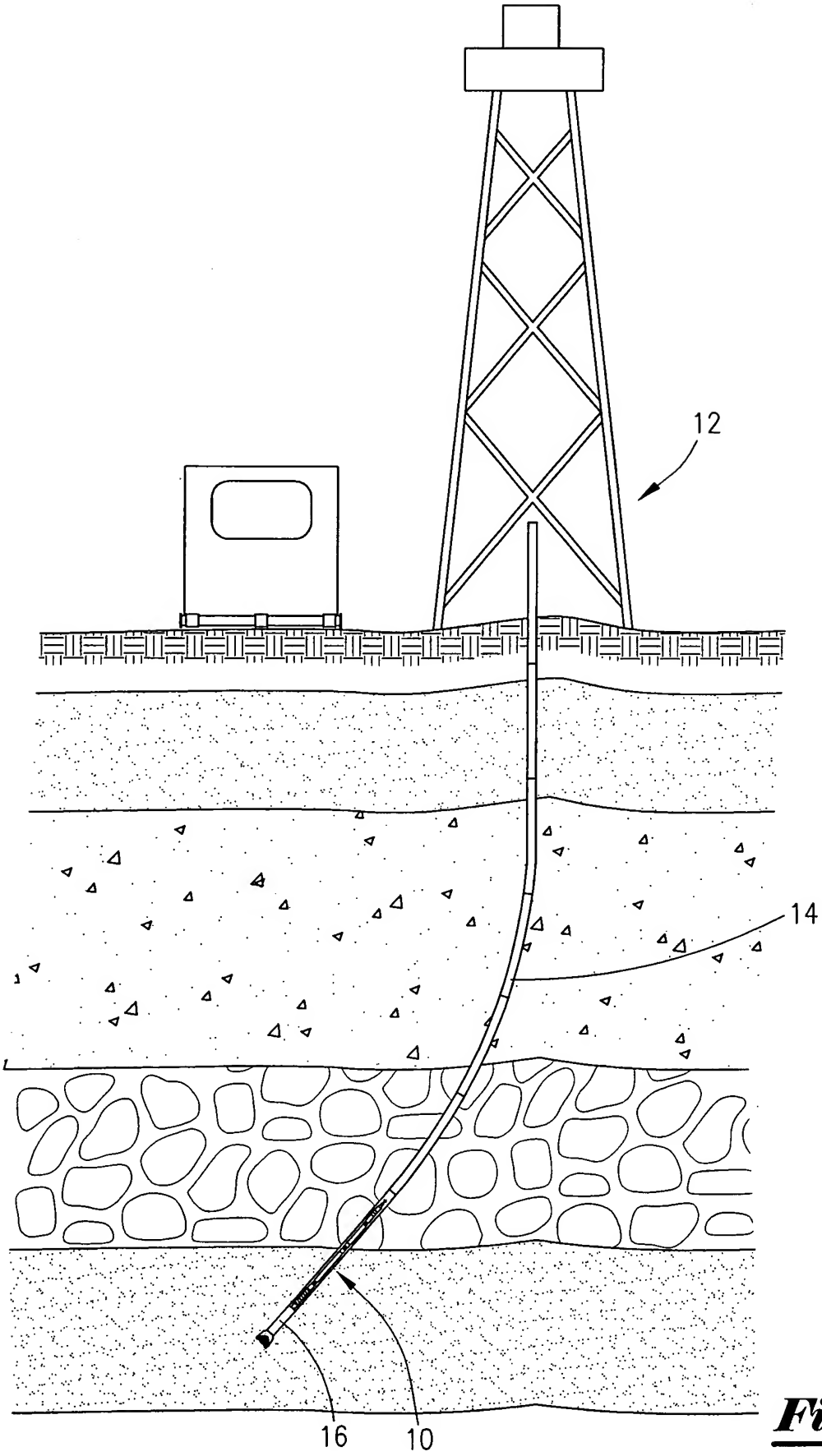

Fig. 1

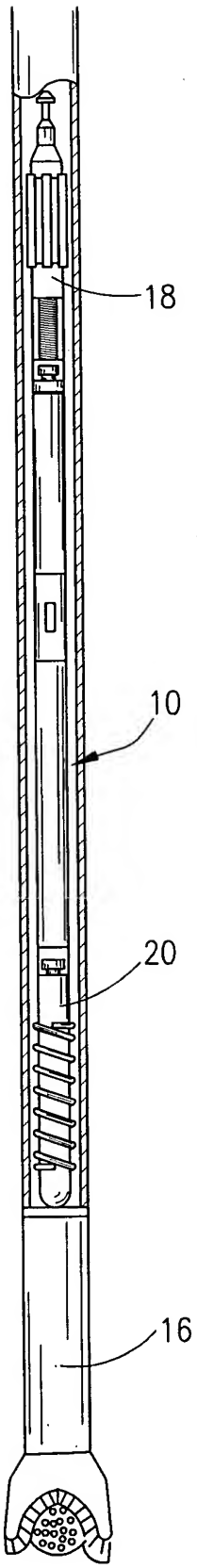

Fig. 2

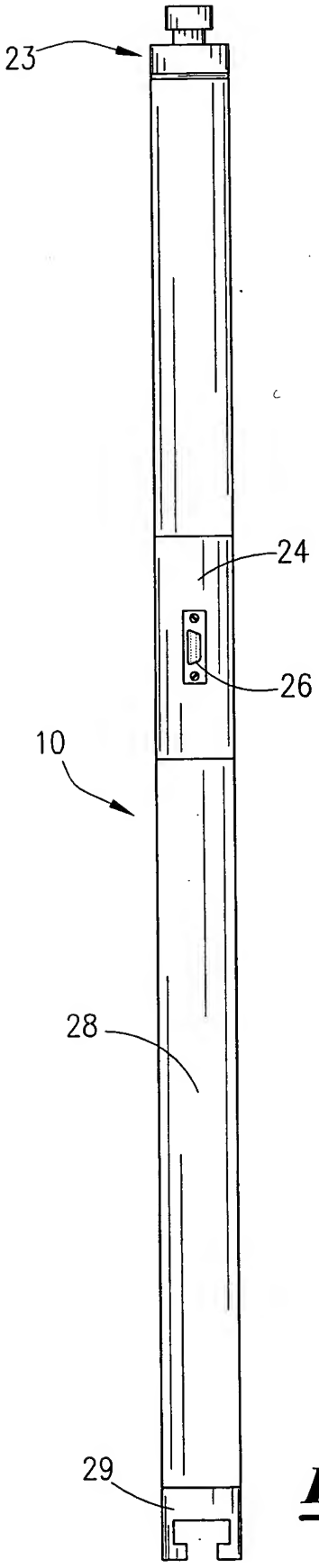

Fig. 3

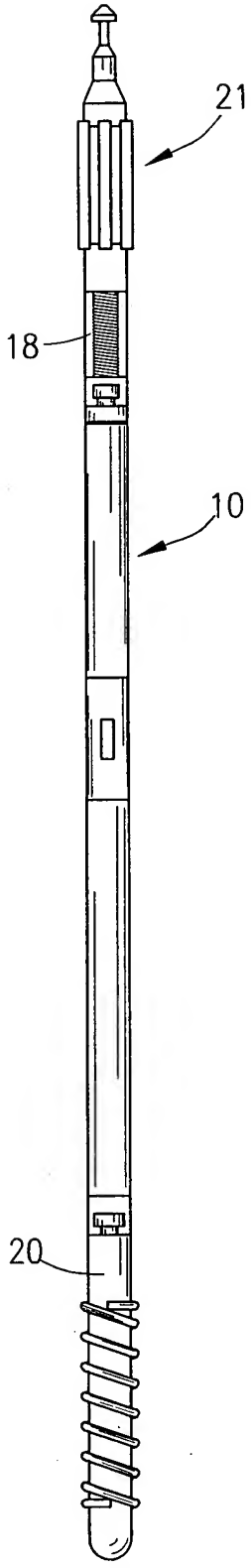

Fig. 4

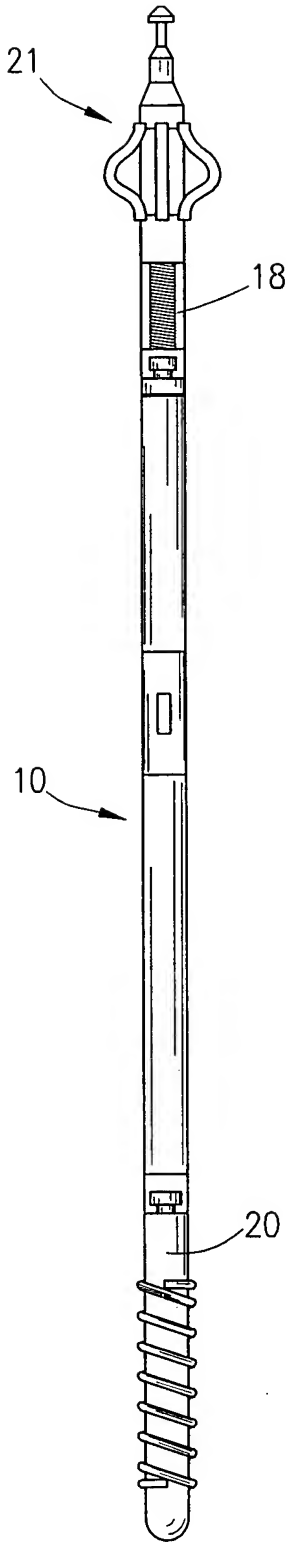

Fig. 5

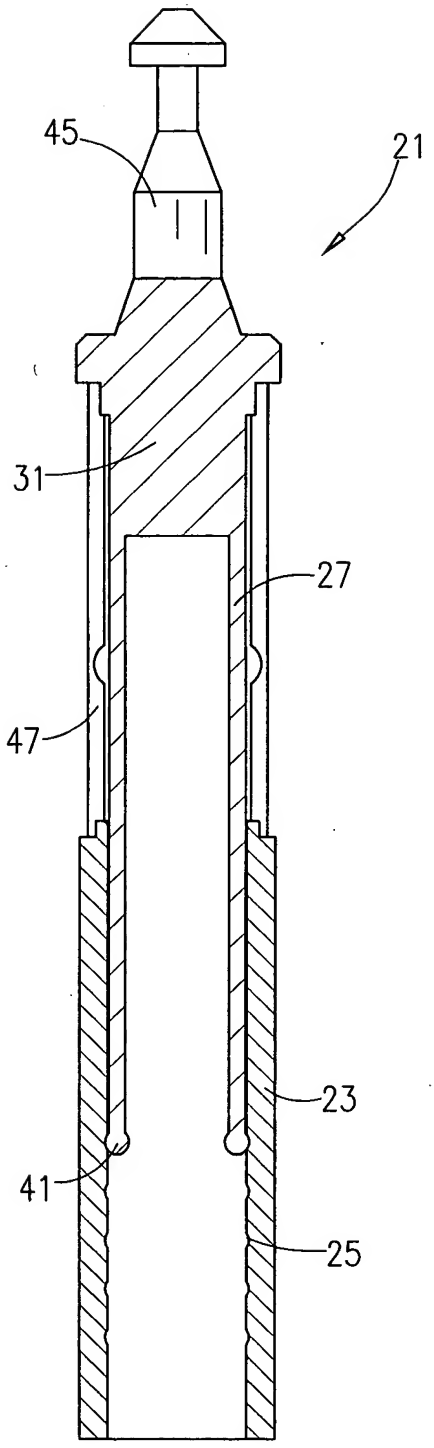

Fig. 5A

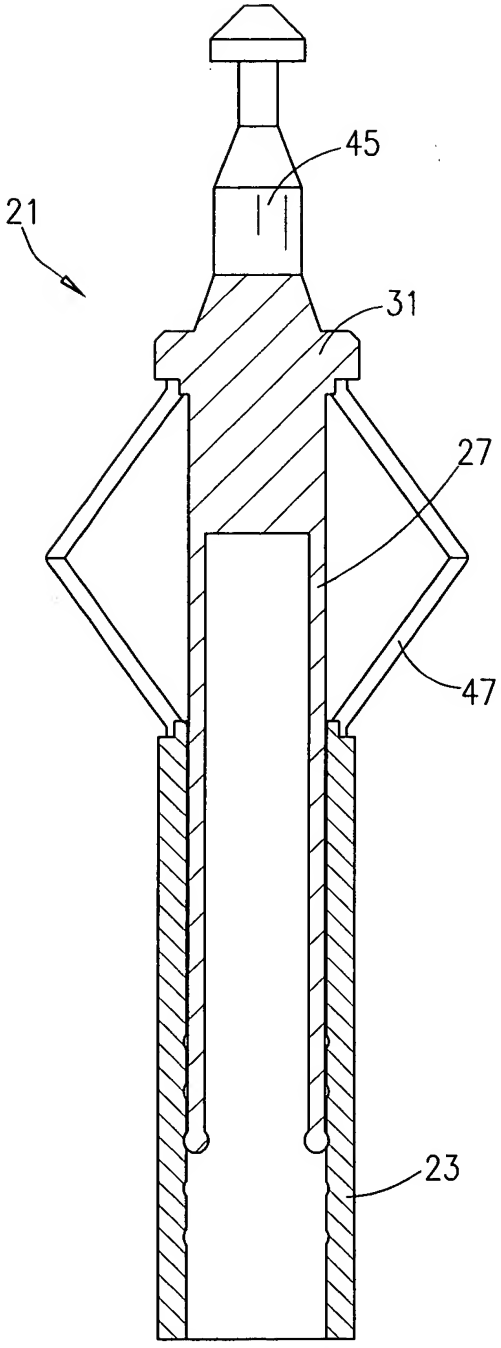

Fig. 5B

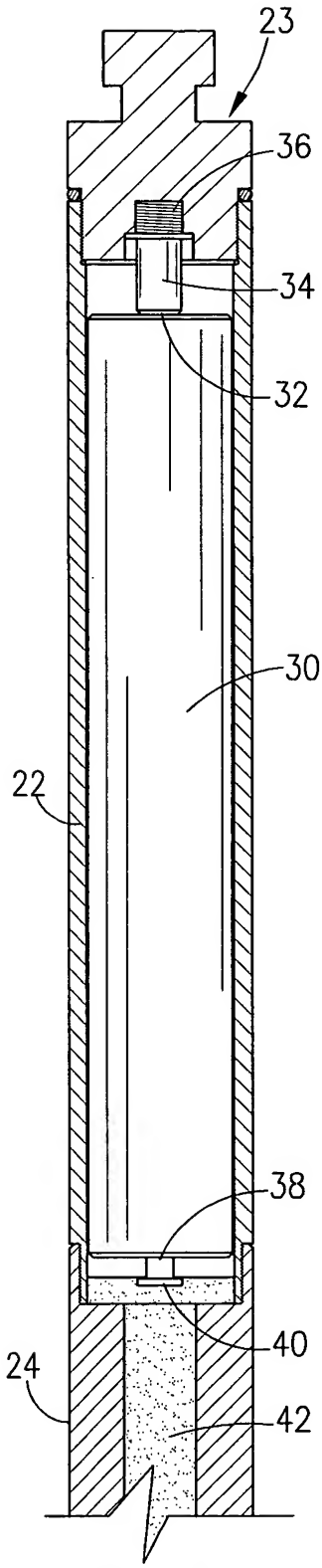

Fig. 6A

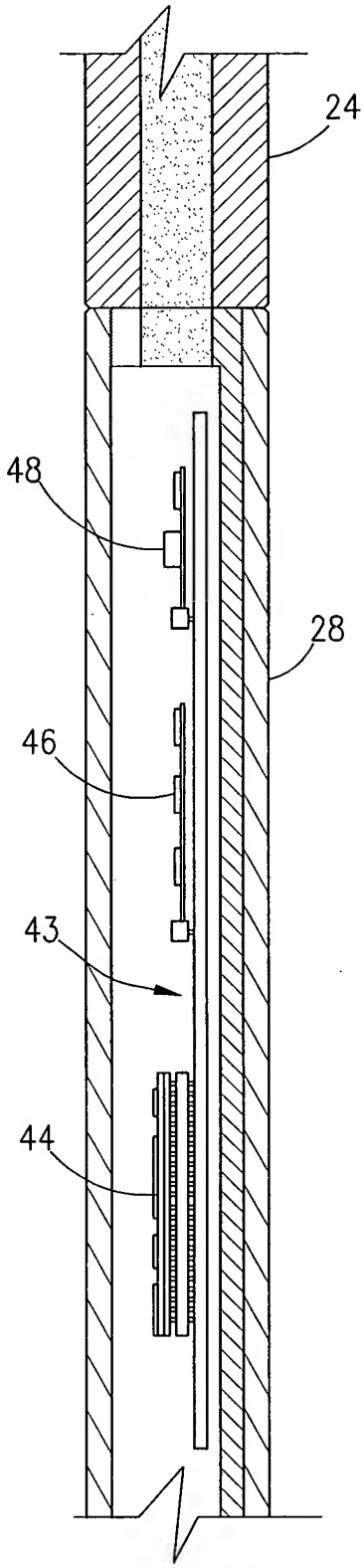

Fig. 6B

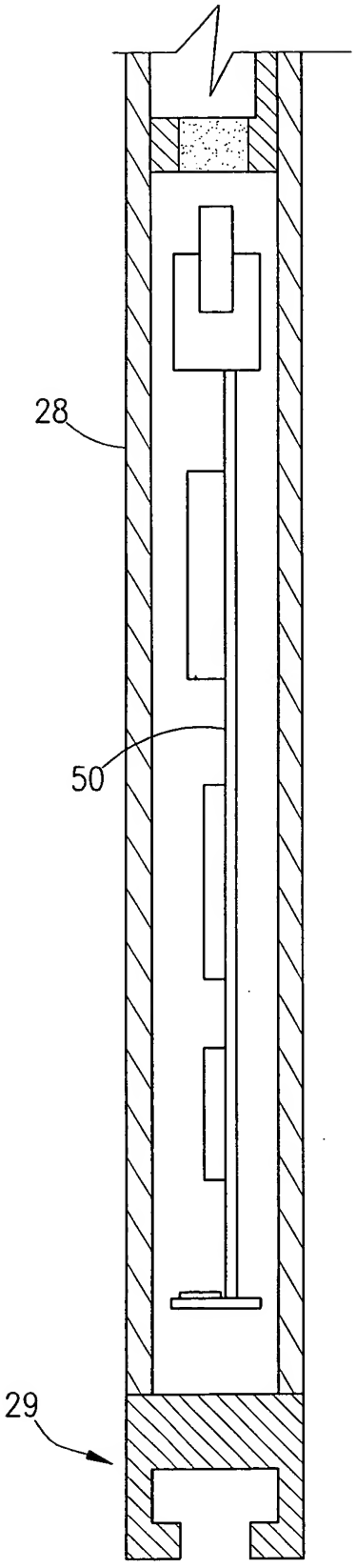

Fig. 6C

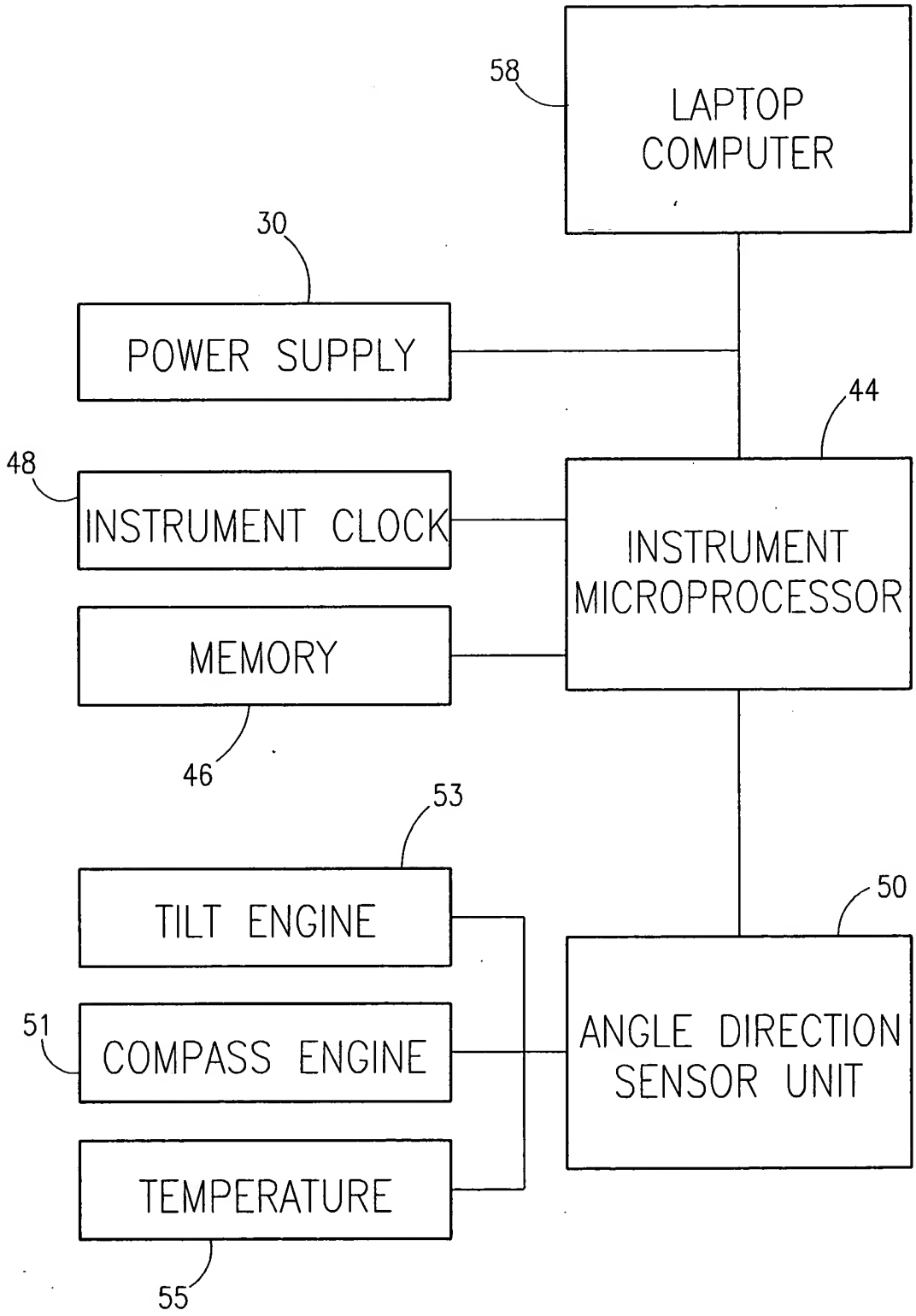
58
LAPTOP COMPUTER
30
POWER SUPPLY
44
48
INSTRUMENT CLOCK
INSTRUMENT MICROPROCESSOR
MEMORY
46
53
TILT ENGINE
50
51
COMPASS ENGINE
ANGLE DIRECTION SENSOR UNIT
TEMPERATURE
55

Fig. 7

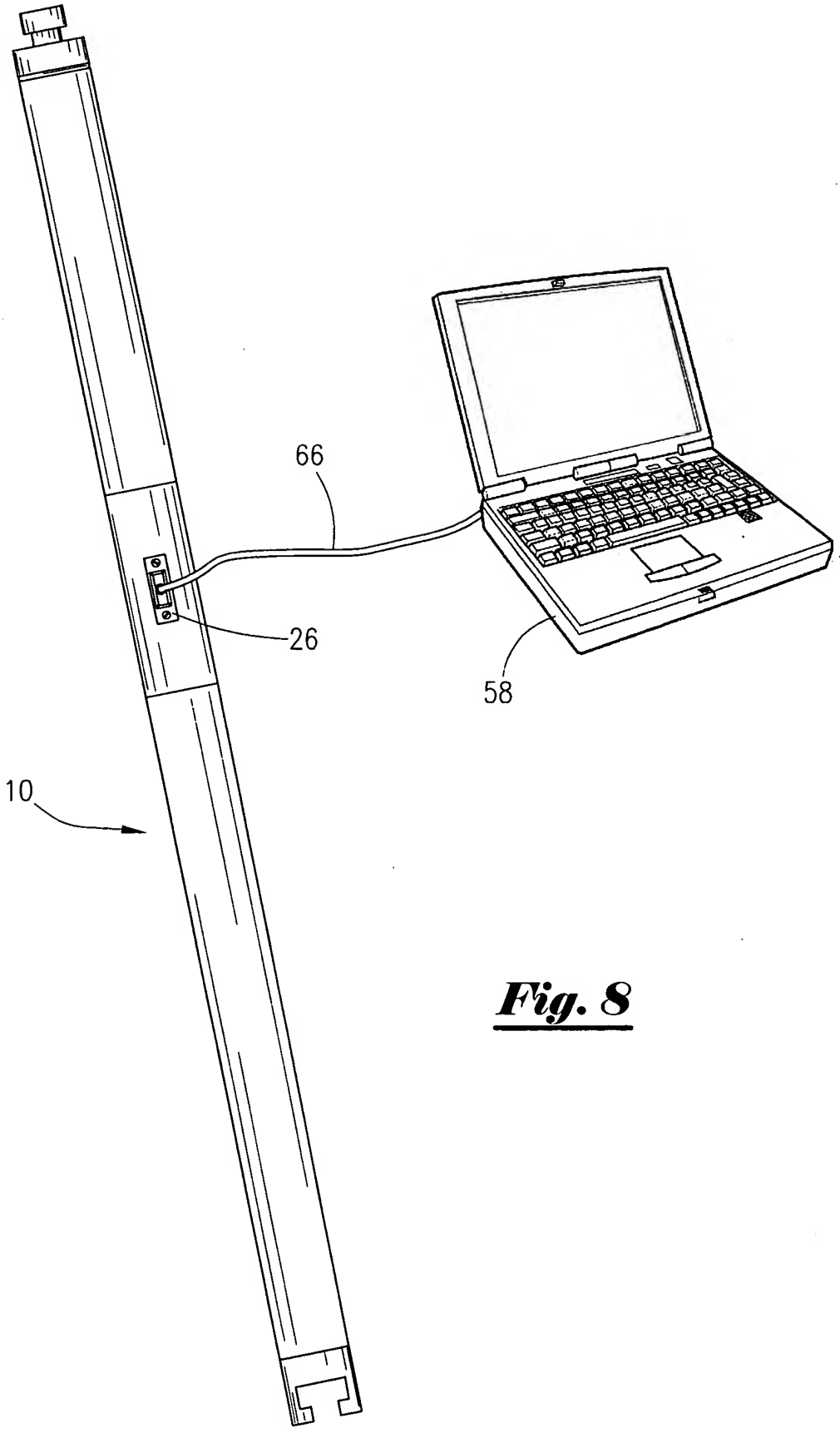

Fig. 8

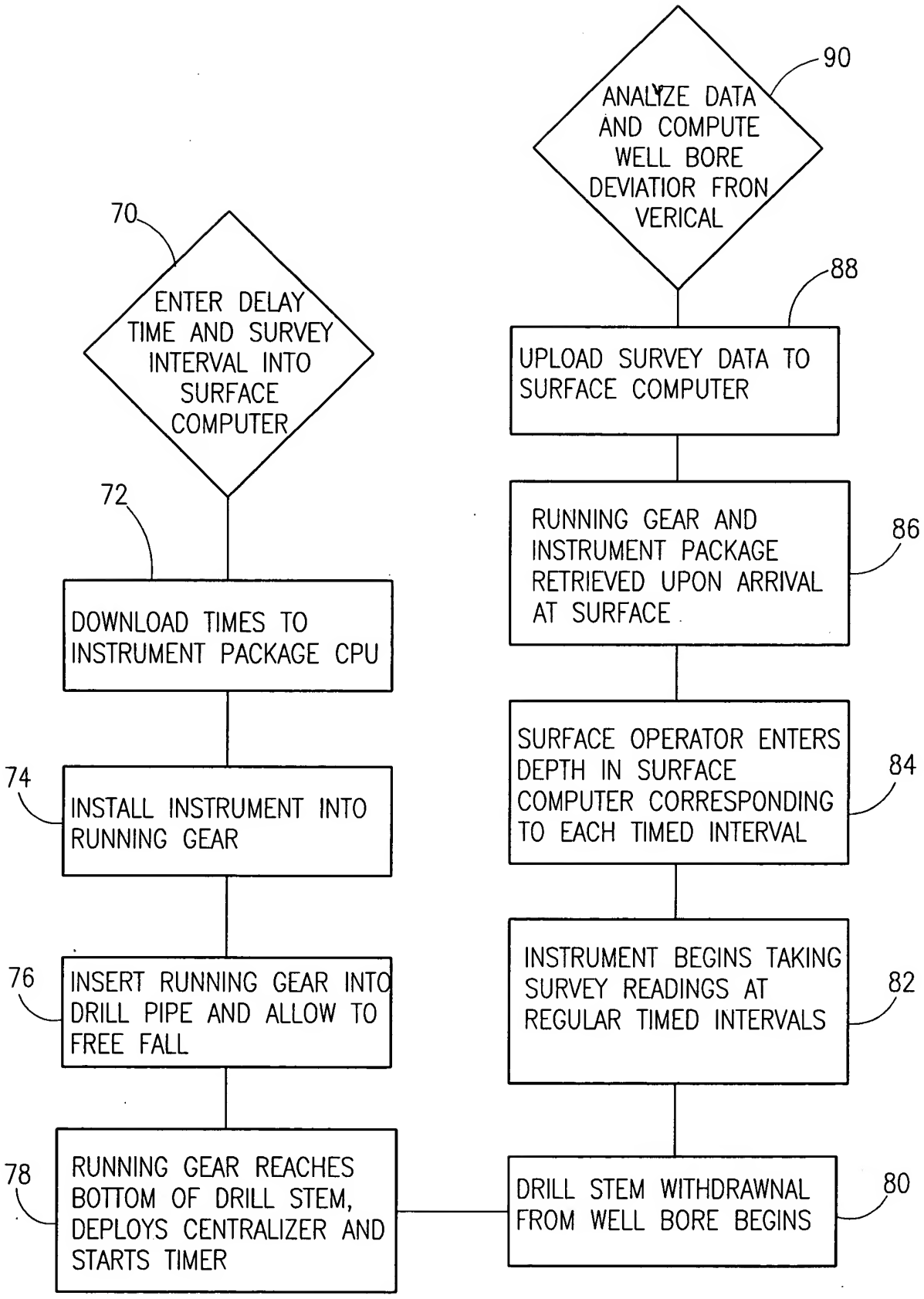
70
ENTER DELAY TIME AND SURVEY INTERVAL INTO SURFACE COMPUTER
72
DOWNLOAD TIMES TO INSTRUMENT PACKAGE CPU
74
INSTALL INSTRUMENT INTO RUNNING GEAR
76
INSERT RUNNING GEAR INTO DRILL PIPE AND ALLOW TO FREE FALL
78
RUNNING GEAR REACHES BOTTOM OF DRILL STEM, DEPLOYS CENTRALIZER AND STARTS TIMER
80
DRILL STEM WITHDRAWNAL FROM WELL BORE BEGINS
82
INSTRUMENT BEGINS TAKING SURVEY READINGS AT REGULAR TIMED INTERVALS
84
SURFACE OPERATOR ENTERS DEPTH IN SURFACE COMPUTER CORRESPONDING TO EACH TIMED INTERVAL
86
RUNNING GEAR AND INSTRUMENT PACKAGE RETRIEVED UPON ARRIVAL AT SURFACE
88
UPLOAD SURVEY DATA TO SURFACE COMPUTER
90
ANALYZE DATA AND COMPUTE WELL BORE DEVIATIOR FRON VERICAL

Fig. 9